

Ceftizoxime in the treatment of uncomplicated gonorrhoea

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SUMMARY A total of 74 men and 26 women with uncomplicated gonorrhoea were treated with ceftizoxime sodium 0.5 g intramuscularly. The cure rate was 99% and included successful treatment of four infections due to β -lactamase producing organisms. The minimum inhibitory concentrations (MICs) of ceftizoxime in vitro were very much lower than those of penicillin and cefuroxime, and side effects were minimal. We conclude that ceftizoxime is effective against *Neisseria gonorrhoeae* in vivo and in vitro.

Introduction

Ceftizoxime is a new semisynthetic parenteral cephalosporin which is stable against most β -lactamases. It has high peak serum concentrations after injection, low protein binding, and is excreted unchanged in the urine. The serum half life is 100 minutes. These properties make ceftizoxime a potentially useful antibiotic for the treatment of genital infections due to *Neisseria gonorrhoeae*. We therefore examined the efficacy of a single 0.5 g dose of ceftizoxime in the treatment of uncomplicated gonorrhoea.

Patients and methods

PATIENTS

We studied 115 consecutive patients presenting to the department of genitourinary medicine with culture positive uncomplicated anogenital gonorrhoea. Samples were taken from the urethra of heterosexual men and from urethra, rectum, and pharynx of homosexual men. Samples were taken from the urethra, cervix, rectum, and pharynx of women who were known contacts. Other women who subsequently gave positive results for *N gonorrhoeae* also had samples taken additionally from the rectum and pharynx on at least two follow up occasions. Patients were treated with a single dose of ceftizoxime sodium 0.5 g given intramuscularly, and were seen for follow up at an average of 3 days after treatment (range 2-6 days) when repeated samples were taken for culture.

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BACTERIOLOGICAL METHODS

All samples were inoculated immediately on to gonococcal medium, composed of Difco GC agar base, 10% lysed horse blood, 1% sterile defined supplement (Kellogg's modified formula), and Oxoid antibiotic supplement, and were incubated in an atmosphere containing 8% carbon dioxide. *N gonorrhoeae* was identified by using the Minitek identification procedure (BBL Microbiology Systems) and tested for the production of β -lactamase by the chromogenic cephalosporin technique. Agar dilution susceptibility testing was performed for ceftizoxime, cefuroxime, and penicillin using an inoculum of 5×10^5 colony forming units (cfu)/ml on the gonococcal medium without the antibiotic supplement. The minimum inhibitory concentration (MIC) was the lowest concentration of antibiotic that inhibited the growth of clinical isolate after appropriate incubation for 24 hours.

Results

Of 115 patients enrolled in the trial, 15 defaulted from follow up. The distribution of infection sites is shown in table I. The only treatment failure was in a woman with continuing urethral and cervical infection five days after treatment, and this may have repre-

TABLE I Distribution of sites infected with *N gonorrhoeae* in 100 patients

Patients	Urethra	Cervix	Rectum	Pharynx
Men (n = 74)	69		8	
Women (n = 26)	24	24	12	2
Total (n = 100)	93	24	20	2

TABLE II Percentages of 100 clinical isolates of *N gonorrhoeae* inhibited by different concentrations of three antibiotics

Antibiotic	% Inhibited by concentrations (mg/l) of:									
	≤0.007	0.015	0.03	0.06	0.125	0.25	0.5	1	2	≥4
Ceftizoxime	100									
Cefuroxime	28	64	73	87	91	95	99	100		
Penicillin G	6	26	30	51	65	79	89	94	98	100

sented reinfection rather than a failure of treatment, as the organism was fully sensitive to ceftizoxime. The cure rate was therefore 99 out of 100 (99%). There were no significant side effects, but most patients experienced pain at the site of the injection.

Table II shows the MICs of penicillin, cefuroxime, and ceftizoxime; concentrations of ≥4 mg/l, 1 mg/l, and ≤0.007 mg/l respectively resulted in 100% inhibition of the organisms isolated.

Discussion

We found 0.5 g of ceftizoxime effective in the treatment of gonorrhoea, which confirmed the findings of Slutkin *et al.*¹ and Lutz *et al.*² Our isolates demonstrated considerable sensitivity to ceftizoxime, which had an MIC of ≤0.007 mg/l for all isolates. These figures are lower than previously reported.^{1,2}

It is worth noting that infections at all sites including the rectum and pharynx were readily cured by 0.5 g ceftizoxime, despite the belief that rectal and

pharyngeal infections are more difficult to cure than those at other sites.³ Ceftizoxime was also effective against β-lactamase producing organisms. We feel that this broad spectrum cephalosporin antibiotic has a place in the treatment of infection caused by penicillinase producing *N gonorrhoeae* (PPNG) and non-PPNG. Further work in rectal and pharyngeal infections would be helpful.

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References

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